What is claimed is:

1. A method for allocating RAKE receiver fingers among a plurality of multipath regions in a received signal, the method comprising:

determining a required number of fingers for each multipath region;

determining an allocated number of fingers for each multipath region according to an area-based weighting scheme;

allocating a number of fingers to each multipath region based on the required number of fingers and the allocated number of fingers such that any multipath region that is allocated fewer than its required number of fingers is deemed to have a non-zero residual area;

allocating any surplus fingers to any multipath regions having non-zero residual areas until either no surplus fingers remain or each multipath region is allocated its required number of fingers; and

placing any fingers allocated to each multipath region within the multipath region.

2. The method of claim 1, wherein determining an allocated number of fingers for each multipath region according to an area-based weighting scheme comprises:

determining an area under each multipath region;

determining a fractional area for each multipath region based upon the area under each multipath region; and

dividing a plurality of available fingers according to the fractional area of each multipath region in such a way that no multipath region is allocated more than its required number of fingers.

3. The method of claim 2, wherein determining a fractional area for a multipath region based upon the area under each multipath region comprises:

determining a sum of all multipath region areas; and

dividing the area under the multipath region by the sum of all multipath region areas.

4. The method of claim 1, wherein allocating any surplus fingers comprises:

allocating any surplus fingers based upon the magnitude of the residual area for all multipath regions having non-zero residual areas.

5. The method of claim 1, wherein placing any fingers allocated to a multipath region comprises:

placing a finger at a peak of the multipath region, if the multipath region is allocated exactly one finger; and

placing a first finger at the first path of the multipath region, placing a second finger at the last path of the multipath region, and placing any remaining fingers uniformly in a remaining span width, if the multipath region is allocated at least two fingers.

6. The method of claim 5, wherein placing a first finger at a first path of the multipath region and placing a second finger at a last path of the multipath region comprises:

placing the first finger at a StartIndex + Δ_0; and

placing the second finger at a StartIndex + LengthofSpan – 1 - Δ_0, wherein StartIndex is a starting index for the multipath region, LengthofSpan is a length of the multipath region, and Δ_0 is a predetermined offset to find the first path on the edges of the multipath region.

7. The method of claim 1, wherein placing any fingers allocated to a multipath region comprises:

placing any fingers allocated to the multipath region in such a way that there is at least a predetermined minimum separation between fingers.

8. The method of claim 1, wherein:

each multipath region k is a contiguous interval characterized by a starting index N_k, a length L_k, and an area $A_k = \sum_{i=0}^{L_k-1} F_{dp}(N_k + i)$, where $F_{dp}(N_k + i)$ denotes a power delay profile function at a time delay of 'i' samples from the starting index N_k;

determining the required number of fingers for each multipath region comprises determining a required number of fingers X_k for each multipath region k such that $X_k = 1$ if $(L_k < C(\Delta_o, \Delta_s))$ and otherwise $X_k = \lfloor [L_k - C(\Delta_o, \Delta_s) - 1]/\Delta_s \rfloor + 2$, where $\lfloor . \rfloor$ represents a flooring operation, $C(\Delta_o, \Delta_s) = 2\Delta_o + \Delta_s - \lfloor \Delta_s / 2 \rfloor + 1$, Δ_o is an offset to compensate the starting and falling edges of the RC pulse, and Δ_s is the minimum separation between two fingers;

determining the allocated number of fingers for each multipath region comprises determining an allocated number of fingers Y_k for each multipath region k such that $Y_k = \lfloor SoftY_k \rfloor$, where $\mathrm{SoftY}_k = \frac{A_k}{\sum_k A_k} * N_f$, and N_f is the number of available fingers;

allocating the number of fingers to each multipath region comprises allocating *CurrentAlloc(k)* = X_k fingers to the multipath region k such that the multipath region k has a residual area *ResidualArea(k)* = *0* and increasing a number of surplus fingers *SurplusFingers* by $4Y_k - 2X_k - 2$, if $4Y_k >= 2X_k + 2$, and otherwise allocating Y_k fingers to the multipath region k such that the multipath region k has a residual area *ResidualArea(k)* = $A_k (1 - Y_k/X_k)$; and

allocating any surplus fingers to any multipath regions having non-zero residual areas comprises, while the number of surplus fingers *SurplusFingers* is greater than zero, iteratively:

finding a multipath region j having the largest residual area;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is less than four, reducing the residual area for the multipath region j such that *ResidualArea(j)* = *0* and reiterating;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is greater than or equal to four, increasing the finger allocation for the multipath region j such that *CurrentAlloc(j)* += *1*, reducing the number of surplus

fingers such that *SurplusFingers* += *-4*, reducing the residual area for the multipath region j such that $ResidualArea(j)$ += $-A_k/X_k$, and reiterating;

if the multipath region j is allocated at least one finger, increasing the finger allocation for the multipath region j such that $CurrentAlloc(j)$ += *1*, reducing the number of surplus fingers such that *SurplusFingers* += *-2*, reducing the residual area for the multipath region j such that $ResidualArea(j)$ += $-A_k/X_k$, and reiterating.

9. An apparatus comprising a RAKE receiver having finger allocation logic for allocating a plurality of fingers among multipath regions of a received signal, wherein the finger allocation logic comprises:

logic for determining a required number of fingers for each multipath region;

logic for determining an allocated number of fingers for each multipath region according to an area-based weighting scheme;

logic for allocating a number of fingers to each multipath region based on the required number of fingers and the allocated number of fingers such that any multipath region that is allocated fewer than its required number of fingers is deemed to have a non-zero residual area;

logic for allocating any surplus fingers to any multipath regions having non-zero residual areas until either no surplus fingers remain or each multipath region is allocated its required number of fingers; and

logic for placing any fingers allocated to each multipath region within the multipath region.

10. The apparatus of claim 9, wherein the logic for determining an allocated number of fingers for each multipath region according to an area-based weighting scheme comprises:

logic for determining an area under each multipath region;

logic for determining a fractional area for each multipath region based upon the area under each multipath region; and

logic for dividing a plurality of available fingers according to the fractional area of each multipath region in such a way that no multipath region is allocated more than its required number of fingers..

11. The apparatus of claim 10, wherein the logic for determining the fractional area for a multipath region based upon the area under each multipath region comprises:

logic for determining a sum of all multipath region areas; and

logic for dividing the area under the multipath region by the sum of all multipath region areas.

12. The apparatus of claim 9, wherein the logic for allocating any surplus fingers comprises:

logic for allocating any surplus fingers based upon the magnitude of the residual area for all multipath regions having non-zero residual areas.

13. The apparatus of claim 9, wherein the logic for placing any fingers allocated to a multipath region comprises:

logic for placing a finger at a peak of the multipath region, if the multipath region is allocated exactly one finger; and

logic for placing a first finger substantially at a first path of the multipath region, placing a second finger substantially at a last path of the multipath region, and placing any remaining fingers uniformly in a remaining span width, if the multipath region is allocated at least two fingers.

14. The apparatus of claim 13, wherein:

the first finger is placed at a StartIndex + Δ_o; and

the second finger is placed at a StartIndex + LengthofSpan – 1 - Δ_o, wherein StartIndex is a starting index for the multipath region, LengthofSpan is a length of the multipath region, and Δ_o is a predetermined offset to find the first path on the edges of the multipath region.

15. The apparatus of claim 9, wherein the logic for placing any fingers allocated to a multipath region comprises:

logic for placing any fingers allocated to the multipath region in such a way that there is at least a predetermined minimum separation between fingers.

16. The apparatus of claim 9, wherein:

each multipath region k is a contiguous interval characterized by a starting index N_k, a length L_k, and an area $A_k = \sum_{i=0}^{L_k-1} F_{dp}(N_k + i)$, where $F_{dp}(N_k + i)$ denotes a power delay profile function at a time delay of 'i' samples from the starting index N_k;

the logic for determining the required number of fingers for each multipath region is operably coupled to determine a required number of fingers X_k for each multipath region k such that $X_k = 1$ if $(L_k < C(\Delta_o, \Delta_s))$ and otherwise $X_k = \lfloor [L_k - C(\Delta_o, \Delta_s) - 1]/\Delta_s \rfloor + 2$, where $\lfloor . \rfloor$ represents a flooring operation, $C(\Delta_o, \Delta_s) = 2\Delta_o + \Delta_s - \lfloor \Delta_s / 2 \rfloor + 1$, Δ_o is an offset to compensate the starting and falling edges of the RC pulse, and Δ_s is the minimum separation between two fingers;

the logic for determining the allocated number of fingers for each multipath region is operably coupled to determine an allocated number of fingers Y_k for each multipath region k such that $Y_k = \lfloor SoftY_k \rfloor$, where $\mathrm{SoftY}_k = \frac{A_k}{\sum_k A_k} * N_f$, and N_f is the number of available fingers;

the logic for allocating the number of fingers to each multipath region is operably coupled to allocate *CurrentAlloc(k)* = X_k fingers to the multipath region k such that the multipath region k has a residual area *ResidualArea(k) = 0* and increase a number of surplus fingers *SurplusFingers* by $4Y_k - 2X_k - 2$, if $4Y_k >= 2X_k + 2$, and otherwise allocate Y_k fingers to the multipath region k such that the multipath region k has a residual area *ResidualArea(k)* $= A_k (1 - Y_k/X_k)$; and

the logic for allocating any surplus fingers to any multipath regions having non-zero residual areas is operably coupled to, while the number of surplus fingers *SurplusFingers* is greater than zero, iteratively:

find a multipath region j having the largest residual area;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is less than four, reduce the residual area for the multipath region j such that *ResidualArea(j) = 0* and reiterate;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is greater than or equal to four, increase the finger allocation for the multipath region j such that *CurrentAlloc(j) += 1*, reduce the number of surplus fingers such that *SurplusFingers += -4*, reduce the residual area for the multipath region j such that *ResidualArea(j)* $+= -A_k/X_k$, and reiterate;

if the multipath region j is allocated at least one finger, increase the finger allocation for the multipath region j such that *CurrentAlloc(j) += 1*, reduce the number of surplus fingers such that *SurplusFingers += -2*, reduce the residual area for the multipath region j such that *ResidualArea(j)* $+= -A_k/X_k$, and reiterate.

17. An apparatus comprising a digital storage medium having embodied therein a program for allocating a plurality of fingers among multipath regions of a received signal in a RAKE receiver, the program comprising:

logic for determining a required number of fingers for each multipath region;

logic for determining an allocated number of fingers for each multipath region according to an area-based weighting scheme;

logic for allocating a number of fingers to each multipath region based on the required number of fingers and the allocated number of fingers such that any multipath region that is allocated fewer than its required number of fingers is deemed to have a non-zero residual area;

logic for allocating any surplus fingers to any multipath regions having non-zero residual areas until either no surplus fingers remain or each multipath region is allocated its required number of fingers; and

logic for placing any fingers allocated to each multipath region within the multipath region.

18. The apparatus of claim 17, wherein the logic for determining an allocated number of fingers for each multipath region according to an area-based weighting scheme comprises:

logic for determining an area under each multipath region;

logic for determining a fractional area for each multipath region based upon the area under each multipath region; and

logic for dividing a plurality of available fingers according to the fractional area of each multipath region in such a way that no multipath region is allocated more than its required number of fingers..

19. The apparatus of claim 18, wherein the logic for determining the fractional area for a multipath region based upon the area under each multipath region comprises:

logic for determining a sum of all multipath region areas; and

logic for dividing the area under the multipath region by the sum of all multipath region areas.

20. The apparatus of claim 17, wherein the logic for allocating any surplus fingers comprises:

logic for allocating any surplus fingers based upon the magnitude of the residual area for all multipath regions having non-zero residual areas.

21. The apparatus of claim 17, wherein the logic for placing any fingers allocated to a multipath region comprises:

logic for placing a finger at a peak of the multipath region, if the multipath region is allocated exactly one finger; and

logic for placing a first finger substantially at a first path of the multipath region, placing a second finger substantially at a last path of the multipath region, and placing any remaining fingers uniformly in a remaining span width, if the multipath region is allocated at least two fingers.

22. The apparatus of claim 21, wherein:

the first finger is placed at a StartIndex + Δ_o; and

the second finger is placed at a StartIndex + LengthofSpan – 1 - Δ_o, wherein StartIndex is a starting index for the multipath region, LengthofSpan is a length of the multipath region, and Δ_o is a predetermined offset to find the first path on the edges of the multipath region.

23. The apparatus of claim 17, wherein the logic for placing any fingers allocated to a multipath region comprises:

logic for placing any fingers allocated to the multipath region in such a way that there is at least a predetermined minimum separation between fingers.

24. The apparatus of claim 17, wherein:

each multipath region k is a contiguous interval characterized by a starting index N_k, a length L_k, and an area $A_k = \sum_{i=0}^{L_k-1} F_{dp}(N_k + i)$, where $F_{dp}(N_k + i)$ denotes a power delay profile function at a time delay of 'i' samples from the starting index N_k;

the logic for determining the required number of fingers for each multipath region is operably coupled to determine a required number of fingers X_k for each multipath region k such that $X_k = 1$ if $(L_k < C(\Delta_o, \Delta_s))$ and otherwise $X_k = \lfloor [L_k - C(\Delta_o, \Delta_s) - 1]/\Delta_s \rfloor + 2$, where $\lfloor . \rfloor$ represents a flooring operation, $C(\Delta_o, \Delta_s) = 2\Delta_o + \Delta_s - \lfloor \Delta_s / 2 \rfloor + 1$, Δ_o is an offset to compensate the starting and falling edges of the RC pulse, and Δ_s is the minimum separation between two fingers;

the logic for determining the allocated number of fingers for each multipath region is operably coupled to determine an allocated number of fingers Y_k for each multipath region k such that $Y_k = \lfloor SoftY_k \rfloor$, where $\mathrm{SoftY}_k = \frac{A_k}{\sum_k A_k} * N_f$, and N_f is the number of available fingers;

the logic for allocating the number of fingers to each multipath region is operably coupled to allocate $CurrentAlloc(k) = X_k$ fingers to the multipath region k such that the multipath region k has a residual area $ResidualArea(k) = 0$ and increase a number of

surplus fingers *SurplusFingers* by $4Y_k - 2X_k - 2$, if $4Y_k >= 2X_k + 2$, and otherwise allocate Y_k fingers to the multipath region k such that the multipath region k has a residual area $ResidualArea(k) = A_k (1 - Y_k/X_k)$; and

the logic for allocating any surplus fingers to any multipath regions having non-zero residual areas is operably coupled to, while the number of surplus fingers *SurplusFingers* is greater than zero, iteratively:

find a multipath region j having the largest residual area;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is less than four, reduce the residual area for the multipath region j such that $ResidualArea(j) = 0$ and reiterate;

if the multipath region j is allocated zero fingers and the number of surplus fingers *SurplusFingers* is greater than or equal to four, increase the finger allocation for the multipath region j such that $CurrentAlloc(j) += 1$, reduce the number of surplus fingers such that $SurplusFingers += -4$, reduce the residual area for the multipath region j such that $ResidualArea(j) += -A_k/X_k$, and reiterate;

if the multipath region j is allocated at least one finger, increase the finger allocation for the multipath region j such that $CurrentAlloc(j) += 1$, reduce the number of surplus fingers such that $SurplusFingers += -2$, reduce the residual area for the multipath region j such that $ResidualArea(j) += -A_k/X_k$, and reiterate.

25. The apparatus of claim 17, wherein the programmable logic device comprises one of:

a microprocessor;

a digital signal processor; and

a field programmable gate array.